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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|---------------------|
| 09/845,158 | 05/01/2001 | Shinichiro Iizuka | 201085US2 | 2672 |
| 22850 | 7590 | 07/14/2005 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | | TRAIL, ALLYSON NEEL |
| ART UNIT | | PAPER NUMBER | | |
| | | | | 2876 |
| DATE MAILED: 07/14/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/845,158 | IIZUKA ET AL. | |
| | Examiner | Art Unit | |
| | Allyson N. Trail | 2876 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 May 2005 and 23 June 2005.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-9, 18-26, 35-60 and 75-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1,5-9, 18, 22-26, 43, 44, 48, 56, 57, 60 and 75-78 is/are allowed.
- 6) Claim(s) 2-4, 19-21, 35-42, 45-47, 49-55, 58, and 59 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 05 January 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Amendment

1. Receipt is acknowledged of the Amendment filed May 23, 2005 and the request for continued examination filed June 23, 2005.

Remarks

2. Claims 1-9, 18-26, 35-60, and 75-78 are currently pending. Claims 1-4, 9, 26, 35-37, 43, 49, 50, 56, and 60 have been amended and claims 75-78 have been added. In the previous office action, claims 9, 26, 43, 44, 48, 56, 57 and 60 were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The current amendment has rewritten claims 9, 26, 43, 56, and 60 into independent form including all of the limitations of the base claim and any intervening claims. Accordingly, these claims are in condition for allowance. Additionally, Claims 44, 48, and 57 are allowable as being dependent on an allowable claim. A personal interview was conducted on May 20, 2005, wherein amendments to claims 1-4, 18-21, 35-37, 49, and 50 were discussed. It was agreed that the prior art, specifically Sato does not disclose measuring a far field pattern (FFP) of a light output from at least one optical component, which is configured to receive with *unrestricted divergence*, the light emitted from the light-emitting element, or means for doing so, as recited in Claims 1 and 18.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 2-4, 19-21, 35-39, 41, 42, 45-47, 49-52, 54, 55, 58, and 59, are rejected under 35 U.S.C. 102(e) as being anticipated by Sato (6,333,777).

Sato teaches the following in reference to claims 2-4, 19-21, 35-39, and 49-52:

FIG. 7 illustrates a flow chart for explaining a sequence for correcting illumination light angular distribution, in an embodiment of the present invention.

Sato's method of measuring an angular distribution of illumination light projected from the projection optical system 16 and positioning the optical component based on the measured angular distribution of the illuminated light will be explained.

Note, by definition, a far-field pattern is the diffraction pattern or angular distribution pattern of a source (such as an LED, ILD, or the output end of an optical fiber) observed at an infinite distance from the source. Therefore when Sato refers to an "angular distribution", this angular distribution is equivalent with a far-field pattern.

"Here, the angular distribution of illumination light which enters the projection optical system 16 can be determined by the angular distribution of illumination light emitted from the optical system 16 and the magnification of the projection optical system 16." (Col. 6, lines 51-55).

In accordance with these embodiments of the present invention as described above, an angular distribution of illumination light projected on a surface to be

illuminated (pattern surface of a reticle or wafer) can be measured. Also, on the basis of the result of the measurement, an optical position of a component or components of an illumination system may be adjusted to assure that the illumination light is supplied at an optimum angle. (Col. 11, lines 3-15).

5. Sato teaches the following in regards to claims 41, 42, 54, and 55:

"Denoted at 5 is an optical system which comprises a condenser lens, a collimator lens and a zoom lens, for example. The optical system 5 serves in cooperation with a movable lens system (illumination state adjusting means) 6 to image the light source image 1b, formed at or adjacent to the second focal point, upon a light entrance surface 7a of an optical integrator (secondary light source forming means) 7." (Col. 4, lines 33-40).

A condensing lens is used to focus or *condense* light onto a specimen or target.

6. Sato teaches the following in regards to claims 45-47, 58, and 59:

"Denoted at 30 is a main control for controlling the components 27, 28, 29, 31, 32, 33 and 34. Information from the detecting system 29 is supplied to the main control 30." (Col. 6, lines 18-20).

"By using the mechanism described above, the angular distribution, at the optical axis La, of illumination light entering the projection optical system 16 is measured. On the basis of the amount of deviation of the angular distribution of the illumination light obtained through the detecting system 29, the main control 30 calculates the direction and amount of movement of the lens system 6 to be made, and it applies to the lens system driving system 32 a signal corresponding to the driving direction and driving

amount. In response to the signal from the main control 30, the lens system driving system 32 moves the lens system 6 in the determined direction and by the determined amount, two-dimensionally. After the driving is completed, measurement of the angular distribution of the illumination light is repeated. If an optimum value has been reached, the sequence goes to a subsequent step. If not, the above-described procedure is repeated until the optimum value is reached.” (Col. 9, lines 13-30).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 40 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (6,333,777) in view of Jouaneh et al (5,367,140).

Sato's teachings are discussed above. Sato fails to specifically teach how the optical component is fixed in a particular position.

Jouaneh et al teaches the following in regards to claims 40 and 53:

“According to an exemplary embodiment of this invention, laser welding of components in an optical package is performed using a piezo-electric actuator to maintain the relative positions of two components during the laser welding process, including the cooling process that follows termination of the application of the laser energy to the package.” (Col. 2, lines 11-17).

In view of Jouaneh et al's teachings it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Jouaneh et al's method of laser welding to fix the components in a particular position. The method of laser welding optical components for in order to fix the components in a specific position is a common process. Lasers are extremely precise and therefor by using one the chance of error is minimal.

Allowable Subject Matter

9. Claims 1, 5-9, 18, 22-26, 43, 44, 48, 56, 57, 60, and 75-78 are allowable over prior art.

The following is an examiner's for allowance: Sato teaches a method and system of assembling an optical module including a light emitting element and at least one optical component, wherein the method and system comprise the steps of measuring a far-field pattern (FFP) of a light output from the one optical component, which is configured to receive the light emitted from the light-emitting element and position the optical component based on the FFP. The above identified prior art of record, taken alone, or in combination with any other prior art, fails to teach or fairly suggest the specific limitations of claims 1, 5-9, 18, 22-26, 43, 44, 48, 56, 57, 60, and 75-78 of the present claimed invention. Initially, prior art fails to specifically teach the method of assembling an optical module, wherein the optical component is configured to receive with unrestricted divergence the light emitted from the light-emitting element. Furthermore, prior art fails to teach the step of detecting a near field pattern (NFP) of the light output from the optical component and positioning the optical component based

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on the NFP, wherein the step of positioning based on the NFP is performed before the step of positioning based on the FFP is not specifically taught by prior art. Moreover, one of ordinary skill in the art would not have been motivated to come to the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

10. Applicant's arguments filed May 23, 2005 have been fully considered but they are not persuasive in regards to claims 2-4, 19-21, 35-42, 45-47, 49-55, 58, and 59. The preceding claims fail to include the limitation of the optical component being configured to receive *with unrestricted divergence* the light emitted from the light-emitting element, which was indicated to overcome the teachings of the prior art of record. Many of the above claims were rewritten in independent form including the limitations of the previous independent claims, which did not include the above limitation.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Allyson N. Trail* whose telephone number is (571) 272-2406. The examiner can normally be reached between the hours of 7:30AM to 4:00PM Monday thru Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee, can be reached on (571) 272-2398. The fax phone number for this Group is (703) 872-9306.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [allyson.trail@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Allyson N. Trail
Patent Examiner
Art Unit 2876
July 7, 2005

Jared J. Fureman
JARED J. FUREMAN
PRIMARY EXAMINER